OBSTETRIC ULTRASOUND EXAMINATION – 1st TRIMESTER

POLICY: Obstetric ultrasound will be performed with an order from a physician or other qualified clinical practitioner. The examination will be supervised and interpreted by a radiologist or other licensed practitioner who is qualified by reason of training to recognize normal and abnormal maternal and fetal anatomy, understand the pathophysiology of pregnancy, and integrate the patient's clinical circumstances and ultrasound findings to optimize the probability of accurate diagnosis.

PURPOSE: To assess the status of a pregnancy in the 1st trimester (up to 13 weeks, 6 days menstrual age) and document normal and abnormal findings.

INDICATIONS: Obstetric ultrasound is indicated in some circumstances for uncomplicated 1st trimester pregnancies (e.g. estimation of gestational age, measurement of fetal growth, suspected multiple gestations, determination of fetal position) or for pregnancy complications (e.g. small- or large-for-dates, vaginal bleeding, suspected fetal death, or suspected ectopic pregnancy). Other indications may include abnormal maternal conditions (e.g. abdominal or pelvic pain or pelvic mass). This list of indications is not comprehensive and the decision to perform prenatal ultrasound is best determined by the primary obstetric practitioner.

PATIENT PREPARATION: In most cases, patients will be investigated from a transabdominal approach through the distended urinary bladder. Patients will be instructed to have completed drinking 32 ounces of liquid one hour prior to the scheduled examination time and refrain from voiding until instructed by Inland Imaging staff. Patients who do not require a filled bladder need no special preparation. Patients should be instructed to take prescribed oral or injectable medication on their normal schedule.

PROCEDURE: The examination will be performed from a transabdominal approach with the maternal urinary bladder distended, often followed by an examination from an endovaginal approach after voiding. The elements of the examination are defined by the AIUM Practice Guidelines for the Performance of Obstetric Ultrasound (effective 10/1/2007). The elements and order of imaging for the complete examination will be:

- Uterus and cervix
- Bilateral adnexa
- Gestational sac
- Fetal pole with crown rump length and heart rate
- Yolk sac
- Amniotic sac
Pregnancy biometry will be recorded on off-line computerized obstetric reporting software (Fetal Growth or Viewpoint) to calculate an estimated gestational age. When available (Viewpoint), computerized obstetric reporting software will be used to report pregnancy structures, maternal structures, and any abnormalities identified.

MATERNAL STRUCTURES:
A survey of maternal structures is intended to evaluate the uterine contour, uterine abnormalities (e.g. duplication anomalies, fibroids). The ovaries and adnexa are evaluated for abnormalities (e.g. ovarian or adnexal mass, ectopic pregnancy). Ovaries that are positioned in the superior pelvis and large pelvic masses may be best demonstrated transabdominally and if encountered, additional images will be required to fully document the findings.

Minimal stored images should include:

- three long axis views of the uterus (sagittal midline, right and left parasagittal) labeled long uterus rt, long uterus ml, and long uterus lt. One midline image should be optimized to display the fundus and one midline image optimized to demonstrate the cervix (it is not necessary to measure the cervix or uterus);
- one long axis cine clip of the uterus from right to left labeled long uterus rt-lt;
- three short axis views perpendicular to the long axis, of the upper, mid and lower thirds of the uterus labeled trans uterus sup, trans uterus mid, and trans uterus inf to demonstrate the uterine walls and gestational sac location.
- one transverse cine clip of the uterus from fundus to cervix labeled trans uterus fund-cvx;
- one view of each ovary oriented parallel to its longest axis, labeled long right or left ovary.
- one view of each ovary oriented parallel to its longest axis, measured in its longest and orthogonal diameters and labeled long right or left ovary;
- in patients whom the ovaries cannot be identified or are absent, a sagittal image of each side of the pelvis shall be obtained and labeled long right or long left adnexa;
- one view of each ovary perpendicular to its long axis, labeled trans right or left ovary, to include its relationship to the uterus or pelvic sidewall;
- one view of each ovary perpendicular to its long axis, measured in its transverse diameter and labeled trans right or left ovary;
- in patients whom the ovaries cannot be identified or are absent, a transverse image of each side of the pelvis shall be obtained and labeled trans right or trans left adnexa;
• one cine clip of each ovary in the plane that optimizes its visualization and labeled appropriately.

Note: If any of these required images cannot be adequately obtained transabdominally, then an endovaginal exam should be performed with the same image requirements.

PREGNANCY EVALUATION
A survey of a pregnancy includes evaluation of the gestational sac and contents. Information obtained includes, but is not limited to, size, position and shape of the gestational sac. The margin of the gestational sac is evaluated for the presence of subchorionic hemorrhage. The gestational sac and fetal pole are measured in order to date the pregnancy. The fetal pole is also evaluated for the presence of fetal heart activity and certain abnormalities (although fetal anatomy is not routinely documented in the 1st trimester of pregnancy).

Minimal stored images should include:
• one longitudinal image of the gestational sac labeled **long gestational sac**;
• one longitudinal image of the gestational sac measured in its longest and orthogonal diameters labeled **long gestational sac**;
• one view of the gestational sac perpendicular to its long axis, labeled **trans gestational sac**;
• one view of the gestational sac perpendicular to its long axis, measured in its greatest transverse diameter and labeled **trans gestational sac**;
• two views of the fetal pole in its longest dimension measured from crown to rump labeled **fetal pole**;
• one m-mode view of the fetal pole with a calculated fetal heart rate;
• one view of the amnionic sac in the plane that optimizes its visualization labeled **amnion**;
• one view of the yolk sac in the plane that optimizes its visualization labeled **yolk sac**;
• one cine clip completely through the fetus in the plane that optimizes its visualization labeled **fetal pole**.

Note: If any of these required images (with the exception of amnionic sac and yolk sac) cannot be adequately obtained transabdominally, then an endovaginal exam should be performed with the same image requirements.

PATHOLOGIC CONDITIONS: When pathologic processes are detected during the course of the examination, extra images are necessary to characterize the abnormality. The following is a description of commonly encountered conditions that should be considered during the examination and the minimum additional
stored images expected for each circumstance. The list is not intended to be comprehensive, and sonographers are expected to apply their knowledge of maternal and fetal anatomy to provide clear images of the abnormalities they encounter. Some conditions and structures may be best imaged from an endovaginal approach or require color and/or spectral Doppler for optimal characterization.

Fetal Demise: If fetal heart activity is absent in a fetus with a crown-rump length of 5mm or greater, then the following additional images must be obtained:

- one cine clip through the fetal pole, optimized to demonstrate absent heart motion within the fetus labeled *fetal pole*;
- one color Doppler image of the fetal pole demonstrating absent heart motion within the fetus labeled *fetal pole*. This image must include color demonstrated nearby within the maternal structures;
- one m-mode through the fetus at the expected location of the fetal heart demonstrating absent heart motion within the fetus labeled *fetal pole*.

If a fetal demise is suspected, in circumstances in which the fetal pole measures less than 10wks or 31mm, then an endovaginal exam is required in order to obtain the above images. All suspected cases of fetal demise should be discussed with the radiologist before the patient is dismissed.

Ectopic Pregnancy: An ectopic pregnancy is any pregnancy which is abnormally located (e.g. cervix, cornua, c-section scar, fallopian tube, pelvic cavity). A 1st Trimester examination is performed in an attempt to identify an ectopic pregnancy when it is clinically indicated (e.g. maternal pain, vaginal bleeding, abnormal b-HCG values) or when an intrauterine pregnancy can not be identified. Transvaginal examination is required when an ectopic pregnancy is suspected or identified. An intrauterine pregnancy does not exclude a coexisting ectopic pregnancy, and in the appropriate clinical setting (e.g. pelvic pain or assisted reproduction), careful investigation of the adnexal is necessary. An ectopic pregnancy may present as a gestational sac, a complex mass or an echogenic mass.

If an ectopic pregnancy is identified, its location (i.e. right or left) and its relationship to normal structures (i.e. uterus and ovary) must be documented in static and cine images. If an ectopic gestational sac is present, in addition to the above images, the sac should be measured in three orthogonal planes and a color Doppler image of the sac documenting the hypervascular trophoblast (“ring of fire”). If an embryo is present in an ectopic gestational sac, the crown rump length should be measured and heart activity sought. If embryonic heart activity is present, it should be documented with cine and m-mode imaging with calculated heart rate.
Investigation and image documentation of the cul-de-sac and parametrial peritoneal spaces is necessary in the setting of ectopic pregnancy to identify hemoperitoneum.